Citation:

Kritchevsky SB, Kritchevsky D. Egg consumption and coronary heart disease: An epidemiologic overview. *J Am Coll Nutr.* 2000 Oct; 19 (5 Suppl): 549S-555S.

PubMed ID: 11023006

Study Design:

Meta-analysis or Systematic Review

Class:

M - Click here for explanation of classification scheme.

Research Design and Implementation Rating:

NEUTRAL: See Research Design and Implementation Criteria Checklist below.

Research Purpose:

To summarize the epidemiologic data linking dietary cholesterol to coronary heart disease (CHD) risk, and to summarize recent studies that have addressed the relationship between egg consumption and coronary risk.

Inclusion Criteria:

None reported.

Exclusion Criteria:

None reported.

Description of Study Protocol:

Recruitment

Not reported.

Design

Systematic Review.

Dietary Intake/Dietary Assessment Methodology

Not applicable; varied between studies.

Blinding used

Not applicable.

Intervention

Not applicable.

Statistical Analysis

Not applicable.

Data Collection Summary:

Timing of Measurements

Not applicable.

Dependent Variables

- Risk of developing cardiovascular disease; measurement techniques varied between studies
- Blood cholesterol levels.

Independent Variables

Egg consumption; measurement techniques varied between studies.

Control Variables

Control variables varied between studies.

Description of Actual Data Sample:

- *Initial N:* Not reported
- *Attrition (final N):*
  - The authors reviewed nine epidemiological studies relating dietary cholesterol to CHD risk
  - The authors reviewed seven studies relating egg consumption to CHD risk
- *Age:* Not applicable
- *Ethnicity:* Not applicable
- *Other relevant demographics:* Not applicable
- *Anthropometrics:* Not applicable
- *Location:* Studies were from:
  - United States
  - Italy
  - Finland
  - England
  - Ireland
  - Netherlands.

Summary of Results:

Evidence Relating Dietary Cholesterol to Coronary Heart Disease Risk

- The epidemiological data relating dietary cholesterol to coronary risk are consistent with a

weak positive association with coronary risk
- While many studies adjusted for total energy intake, few adjusted for dietary saturated fat and only one study adjusted for fiber. This study found a 6% increase in the risk of CHD associated with 200mg per 1,000kcal per day intake of dietary cholesterol.

Dietary Adjustment Factors					
Study	**Average Dietary Cholesterol Intake (mg per 1,000 kcal)**	**Relative Risk of CHD per 200mg increment in Cholesterol Intake per 1,000 kcal**	**Total Energy**	**Fat**	**Fiber**
Honolulu Heart Study	242	1.2	N	N	N
Ireland-Boston Heart Study	233	1.5	N	N	N
Western Electric Study	240	1.9	N	Y	N
Zutphen Study	143	1.8	Y	N	N
Framingham Study: 45-55 year olds	198	1.0	Y	N	N
Framingham Study: 56-65 year olds	208	1.2	Y	N	N
Lipid Research Clinics Prevalence Study: 30-59 year olds	106	1.1	Y	N	N
Lipid Research Clinics Prevalence Study: 40-79 year olds	126	1.2	Y	N	N
Nurses Health Study	190-210	1.12	Y	Y	N
Health Professionals Follow-up Study	144	1.06	Y	Y	Y

Evidence Relating Egg Consumption to Coronary Heart Disease risk

- The epidemiological evidence relation egg consumption to CHD risk is not consistent. Two of three large prospective cohort studies founds no association between egg consumption and coronary risk, while one finds a substantial association
- Only one study addressed confounding by other determinants of disease risk in any comprehensive fashion, and this study found no association.

Study	Egg Consumption Levels Compared (per week)	Relative Risk	Adjustment Factors
Framingham	Men: <2.5 vs. at least 7 Women: <1.5 vs. at least 5	1.3 1.3	None
Italian Women 22-69 years of age	<1 vs. >2	0.8	Age
Finnish men and women 30-69 years of age	Not applicable (average consumption of coronary deaths compared to survivors)	Difference in intake: Men: 1 gm per day Women: 0g per day	Age
Seventh-Day Adventists	<1 vs. at least 3	1.01	None
Oxford Vegetarian Study	<1 vs. at least 6	2.68	Age, gender, smoking, social class
Nurses' Health Study and Health Professionals Follow-up Study	<1 vs. at least 7 Men Women	0.93 0.78	Age, BMI, cigarette smoking, parental history of MI, vitamin supplement use, alcohol consumption, history of HTN, physical activity, total energy intake, bacon consumption, and in women, menopausal status and post-menopausal hormone use

Author Conclusion:

- Dietary cholesterol intake was associated with a modest increase in risk of coronary events
- When dietary confounders are considered, there is no association between egg consumption and risk of coronary events.

Reviewer Comments:

- *The authors did not describe a search plan or inclusion/exclusion criteria for the studies included in this review*
- *Limitations and strengths of the review were not discussed*

• *This study was supported by the American Egg Board and Egg Nutrition Center.*

Research Design and Implementation Criteria Checklist: Review Articles

	Relevance Questions	
1.	Will the answer if true, have a direct bearing on the health of patients?	Yes
2.	Is the outcome or topic something that patients/clients/population groups would care about?	Yes
3.	Is the problem addressed in the review one that is relevant to nutrition or dietetics practice?	Yes
4.	Will the information, if true, require a change in practice?	Yes

	Validity Questions	
1.	Was the question for the review clearly focused and appropriate?	Yes
2.	Was the search strategy used to locate relevant studies comprehensive? Were the databases searched and the search termsused described?	Yes
3.	Were explicit methods used to select studies to include in the review? Were inclusion/exclusion criteria specified and appropriate? Were selection methods unbiased?	Yes
4.	Was there an appraisal of the quality and validity of studies included in the review? Were appraisal methods specified, appropriate, and reproducible?	No
5.	Were specific treatments/interventions/exposures described? Were treatments similar enough to be combined?	Yes
6.	Was the outcome of interest clearly indicated? Were other potential harms and benefits considered?	N/A
7.	Were processes for data abstraction, synthesis, and analysis described? Were they applied consistently across studies and groups? Was there appropriate use of qualitative and/or quantitative synthesis? Was variation in findings among studies analyzed? Were heterogeneity issued considered? If data from studies were aggregated for meta-analysis, was the procedure described?	No
8.	Are the results clearly presented in narrative and/or quantitative terms? If summary statistics are used, are levels of significance and/or confidence intervals included?	Yes
9.	Are conclusions supported by results with biases and limitations taken into consideration? Are limitations of the review identified and discussed?	Yes
10.	Was bias due to the review's funding or sponsorship unlikely?	No